

Domain specifications for various data ...

[fan](#) 25 posts since

Apr 16, 2008

Dear LIS group:

I feel confused by the various domains in lis.config. Here are some specific questions for each domain definition:

- 1) Running domain --- D_r: NO problem for this one. LIS runs over the points within this domain.
- 2) Parameter domain --- D_p: The parameter output seems using D_r, and input parameter data are specified below each data. So what is the purpose for this and what affects it cause?
- 3) Land mask and landcover domain --- D_l: NO problem.
- 4) Topography domain --- D_t: specifies data domain of elevation, slope, aspect, curvature
- 5) Soil data domain --- D_s: I assume it defines all the soil data in this group. But, if we use for example STATSGO data with FAO soil color, there is an inconsistency. What I am trying to do is to extract soil color data for the STATSGO region from the FAO global dataset. So they are within the same domain. Am I doing right?
- 6) There is no domain definition section for albedo, greenness, LAI/SAI, snow depth. Which of the above domains apply to this these data?
- 7) Forcing data: should we provide all the input data (including parameter data) at the desired running resolution (but can be at different domain)? or LIS accepts any resolution and interpolates to model resolution for any or some data?

Thanks in advance for any response, answer, and clarifications.

Xingang Tags: lis, data, domain

[sujay](#) 118 posts since

Sep 20, 2007 1. **Re: Domain specifications for various data sources** Apr 22, 2008 8:08 PM

Xingang,

There are primarily two 'domains' in LIS. 1) the running domain and 2) parameter domain, which is assumed to be the superset of all the parameter data used in a simulation. For example, a LIS run over mississippi could use landcover data for just mississippi, a CONUS soils data and a global LAI data. In this case, the parameter domain should be defined as global.

The other domains (D_l, D_t, D_s etc.) give you some flexibility to bring in other sources of data that are (probably) subset of the parameter domain. Currently an option is not defined for LAI/SAI files because we have not come across a local/small dataset yet. If there is a need for that, we can easily include options to allow that.

The soils data : As you mentioned, all soils data is assumed to be in from the same source (scientifically it probably is not a good idea to mix and match). Since there is no known FAO color data, we have (for now) assumed in the code that FAO data uses the global domain. So in other words, you do not need to create a dummy FAO color data that corresponds to the STATSGO domain. You simply have to set the soil color source to be 1 and define your parameter domain to be global.

All parameter data are expected to be provided at the same resolution (but can be of different spatial extents) as the LIS running grid. The reason is that parameter data interpolation is mostly static and as a result, makes sense to do outside the code, to save some computation. The forcing data in contrast, is interpolated from the native grid/resolution to the LIS grid. So you do not have to worry about preprocessing the forcing data.

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Hope this makes sense.

-S

[fan](#) 25 posts since

Apr 16, 2008 **2. Re: Domain specifications for various data sources** Apr 22, 2008 11:01 PM

in response to: [sujay](#)

Sujay:

Thanks for these answers which are very helpful.

Xingang

[cbblanke](#) 38 posts since

Apr 18, 2008 **3. Re: Domain specifications for various data sources** Apr 23, 2008 11:09 AM

in response to: [sujay](#)

Sujay,

I thought I had this straight but now I'm not sure. The following is my understanding. Tell me if I have this right...

The run domain can be any type (polar, lambert conformal...)

The other domains (parameter, landcover, topography, soil) are all lat/lon domains with spacing given in degrees. You are expected to resample your input data for these to the appropriate size with the data processing programs (avgdata_from_1km.F90, etc.). The output files will have names with (e.g.) 12KM but that really means 0.12 degree spacing, not exactly 12 km spacing. I presume this is so LIS can do a simple bilinear interpolation (the input and output grids being of the same scale, but not necessarily exactly aligned) rather than averaging over many points.

The lower left and upper right lat/lons for the latlon domains are the centers of the grid boxes, so if your grid starts at 180W and your resolution is .12 degrees ("12 km"), the left longitude should be set to -179.94 ($-180 + .12 / 2$).

LAI, SAI, greenness fraction, albedo data, and soil bottom temperature are input on the parameters grid. Are all the sample data on this page: <http://lis.gsfc.nasa.gov/Data/LIS5.0/5.0.params.shtml> on the 60S to 90N grid?

Please correct any misconceptions I have.

Thanks,

Clay

[sujay](#) 118 posts since

Sep 20, 2007 **4. Re: Domain specifications for various data sources** Apr 23, 2008 11:25 AM

in response to: [cbblanke](#) Clay,

Yes, your description is correct. If the domain uses a different map projection than lat/lon, LIS does a neighbor-based lookup of the parameter data. No interpolation is done to the parameter data. So essentially we are doing a reprojection of the parameter data, not an interpolation.

And yes, the parameter data values are defined at the center of the grid point and most of the sample data that we have on the website goes from 60S to 90N.

-S

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[cbblanke](#) 38 posts since

Apr 18, 2008 **5. Re: Domain specifications for various data sources** Apr 23, 2008 11:34 AM

in response to: [sujay](#)

Thanks Sujay, that's good to know. Does the input data (parameters, soil, topo, landcover) have to be at the same nominal resolution as the run domain?

Clay

[sujay](#) 118 posts since

Sep 20, 2007 **6. Re: Domain specifications for various data sources** Apr 23, 2008 11:39 AM

in response to: [cbblanke](#) Yes. all parameter data has to be in the same resolution. Please see my response to Xingang above.

-S